



# King County

**Metropolitan King County Council**

**King County Auditor's Office**

**Cheryle A. Broom**, *King County Auditor*

King County Courthouse

516 Third Avenue, Room W1033

Seattle, WA 98104-3272

**206.296.1655** Fax 206.296.0159

**Email:** KCAO@kingcounty.gov

TTY 296-1024

[www.kingcounty.gov/auditor](http://www.kingcounty.gov/auditor)

## MEMORANDUM

**DATE:** September 21, 2010

**TO:** Metropolitan King County Councilmembers

**FROM:** Cheryle A. Broom, County Auditor

**SUBJECT:** Performance Audit of Transit Bus Procurement

Attached for your review is the Performance Audit of King County Metro Transit Bus Procurement. The objectives of this performance audit included three elements. First, we establish a method that Transit should use to measure bus quality, cost, and timeliness of procurement. Second, using this method, we determine the level of Transit's success in recent bus procurements. Finally, we identify steps that Transit can take to increase the likelihood that upcoming bus procurements will be successful.

In reviewing recent purchases by applying the recommended performance measures, we concluded that Transit has been generally successful in purchasing similar buses at lower cost than other transit entities we surveyed. However, Transit could strengthen its bus quality assurance efforts, and it cannot yet demonstrate that bus purchases have been timely.

Ultimately, implementing our six audit recommendations will facilitate reducing the cost, enhancing the quality, and improving the timeliness of Transit's bus purchases. Implementation will also provide opportunities for council and other policy-makers to ensure county policy and priorities guide bus procurement decisions and increase the likelihood that buses will meet customer, operator, maintenance, service, and regional needs. In addition, by implementing these recommendations, Transit will be able to evaluate, improve, and demonstrate the effectiveness of bus procurement.

The County Executive has concurred with all audit recommendations. See the appendices section for the complete text of the Executive Response and the Auditor's Comments to the Executive Response.

We appreciate Transit's cooperation during this audit process and the contributions of Calyptus Consulting Group during the process of developing a set of bus procurement performance measures.

CB:KW:jl



**PERFORMANCE AUDIT**

**KING COUNTY METRO TRANSIT  
BUS PROCUREMENT**



**King County**

Presented to  
the Metropolitan King County Council  
Government Accountability and Oversight Committee  
by the  
County Auditor's Office

Cheryle A. Broom, King County Auditor  
Ron Perry, Deputy County Auditor  
Larry Brubaker, Senior Principal Management Auditor  
Rob McGowan, Principal Management Auditor  
Kymber Waltmunson, Principal Management Auditor

Report No. 2010-02  
September 21, 2010



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**Abbreviations**

BAFO	Best and Final Offer
BPT	Bus Procurement Team
BRT	Bus Rapid Transit
FTA	Federal Transit Administration
ICE	Independent Cost Estimate
MBMSF	Miles Between Major System Failures
NTD	National Transit Database
OTREC	Oregon Transportation and Research Education Consortium
RFP	Request for Proposal
TCRP	Transit Cooperative Research Program
TFCMG	Transit Fleet Contract Management Group

# EXECUTIVE SUMMARY

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## **Introduction**

This performance audit evaluates Transit's bus procurement program. In order to help determine whether the program successfully delivers quality, cost-effective buses in a timely manner, we identified appropriate performance measures for evaluating the program. We then used those measures to make conclusions about the program to date and to recommend steps Transit can take to increase the likelihood that future bus procurements will be successful.

In the past 10 years, Transit has spent nearly \$1 billion on bus purchases and maintenance (\$342 million on bus purchases and an additional \$653 million on bus maintenance). Transit's current fleet consists of more than 1,350 active vehicles, including transit vans, buses, and trolleys; and over the course of our audit, Transit ordered or put into service an additional 325 buses, while retiring or planning to retire a similar number. Both the size of the financial investment and the significance of the service provided by Transit emphasize that an effective bus procurement program—one that ensures Transit buys the right buses, at the right price, and at the right time—is critical to Transit's operational and financial success.

## **Conclusions and Recommendations**

The significance of Transit's public investment calls for careful attention to monitor and continuously improve the bus procurement program. However, we found that neither Transit nor other public transit agencies we surveyed use performance measures to track the effectiveness of their bus buying programs.

We recommend that Transit implement a performance measurement and performance management approach to enable

them to track and increase the effectiveness of their procurement program by:

- Identifying key areas on which staff can focus improvement efforts,
- Developing a culture of self-improvement and accountability, and
- Communicating results to stakeholders.

Our recommended approach includes annually calculating the results of performance measures, developing action plans to improve procurement outcomes, and updating performance measures and targets to increase their effectiveness. In this report, we recommend that Transit adopt six performance measures which address cost, quality, and timeliness of bus purchases.

We utilized these performance measures to evaluate Transit's bus procurement performance. Our evaluation identified three overarching findings. First, Transit has been generally successful in purchasing similar buses at lower cost than other transit entities we surveyed. Second, Transit could strengthen its bus quality assurance efforts. Third, Transit has information to develop baseline timeliness performance measures; however, Transit cannot demonstrate that buses they have purchased have been put into service in a timely fashion.

In addition to the calculation of bus procurement performance measures, our audit found three areas where procurement planning and practices could be strengthened. First, Transit does not yet have a comprehensive, documented method to determine if the fleet mix they have purchased has resulted in the lowest total cost of fleet ownership. We recommend that Transit fully analyze the costs and benefits of an array of fleet alternatives that could deliver the potential range of future service before



making final procurement decisions. Second, Transit's bus procurements are not specifically guided by Transit or county priorities and do not optimize the investment of resources. To address this, we recommend that Transit develop clear and prioritized strategic procurement goals for each individual procurement. Third, we found that during bus procurement, roles and responsibilities were sometimes unclear and did not fully facilitate achievement of Transit goals. We recommend that Transit undertake a thorough update of procurement processes to resolve these problems.

We also found that the approach to and guidance for bus quality assurance inspections is incomplete and out of date. To resolve this, we recommend that Transit evaluate options for providing on-site bus inspection at the initiation of each procurement process and enhance inspection guidance to reflect a rigorous approach to all phases of the inspection process and define specific methods to achieve quality and accountability.

### **Summary of Executive Response**

The County Executive concurred with and provided a response to the six recommendations made in this report. The response also included proposed implementation timelines. See appendices section for the complete text of the executive response.

### **Summary of Auditor's Comments**

Auditor's comments to the executive response on the recommendations can be found in the appendices section. In summary, Transit will initiate two procurements in 2011; the process to procure 30-foot buses is scheduled to begin in January 2011, and the process to replace the trolleys is planned for later in 2011. These two procurement processes will be costly and important to Transit operations. The risk of delaying implementation of audit recommendations is that opportunities to

reduce the cost, enhance the quality, and improve the timeliness of upcoming bus purchases could be lost. Because Transit invests such significant resources in procurements, even small efficiencies gained from implementation of audit recommendations could result in considerable savings.

# 1 INTRODUCTION

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Purchasing the right fleet, at the right price, and at the right time is critical to Transit's operational and financial success. The right bus should fit the county's policy and service goals while minimizing lifecycle costs. The wrong bus could conflict with goals and/or increase purchase costs and costs related to parts, labor, vehicle downtime, retrofitting to meet standards, and even legal costs.

Bus purchase and maintenance costs represent a significant investment in transportation capital. Transit is entrusted to wisely invest not only a substantial portion of county money, but also a significant contribution of federal funds in bus purchases and maintenance. The following table shows the magnitude of those costs over the past decade:

<b>EXHIBIT A</b>			
<b>Investment in Transit Buses 2000-2009</b>			
	<b>County Contribution</b>	<b>Federal Contribution</b>	<b>Total</b>
Bus Purchase	\$85 Million	\$257 Million	\$342 Million
Bus Maintenance	\$314 Million	\$339 Million	\$653 Million
<b>Total</b>	\$399 Million	\$596 Million	\$995 million

**SOURCE:** King County Auditor's Office and King County Metro Transit

Transit buses range from \$300,000 for a 30-foot bus to \$775,000 for a 60-foot hybrid bus. Transit estimates that future vehicle purchases could exceed \$1 million per vehicle for electric trolleys.

### **Transit's Current Bus Fleets**

Transit manages 1,350 active Metro Transit revenue vehicles, including transit vans, buses, and trolleys. Exhibit B shows the eight different types of revenue fleets, ordered by the issue date of the Request for Proposals (RFP).

<b>EXHIBIT B</b>				
<b>Active Transit Revenue Fleet, by Procurement<sup>1</sup></b>				
<b>RFP Date</b>	<b>Manufacturer</b>	<b>Model Year</b>	<b>Bus Type</b>	<b>Quantity</b>
06/13/1994	Gillig	1996-1998	40-foot diesel	395
			35-foot diesel	15
10/28/1996	New Flyer	1998, 2000	60-foot diesel	272
11/03/1997	Gillig	1999	30-foot diesel	95
05/10/1999	Gillig	2001	40-foot trolley	100
	Breda Conversion	2002	60-foot trolley	59
02/12/2001	Champion	2002	25-foot diesel	34
10/01/2001	New Flyer	2003	40-foot diesel	100
03/03/2003	New Flyer	2004	60-foot hybrid	212
			60-foot diesel	30
09/04/2006	New Flyer	2008	60-foot hybrid	38
<b>Total</b>				<b>1,350</b>

**SOURCE:** King County Auditor's Office and King County Metro Transit

### **Most Recent Transit Procurements**

Buses from three other procurements began entering service as our audit was underway. Exhibit C summarizes the status<sup>2</sup> of these most recent procurements.

<sup>1</sup> Over the course of our audit, Transit retired some of these buses, put new buses into service, and accepted delivery of additional buses. However, it was necessary for us to use a "snapshot" of the Transit fleet in order to maintain consistency in our analysis.

<sup>2</sup> Buses listed as "inactive" were on Transit property, but not yet in service.

**EXHIBIT C**  
**Recent Bus Procurements**

RFP Date	Manufacturer	Contract	Bus Type	Model Year	Total Units	Fleet Status
09/04/2006	New Flyer	MB 06-2	60-ft hybrid	2008-2009	53	Active
				2009	20	Inactive
				2010-2011	56	On order
10/02/2006	StarTrans	MB 06-1	27-ft van	2008	35	Inactive
06/30/2008	Daimler	MB 08-1	40-ft hybrid	2011	94	In production
				2011	62	On order

**SOURCE:** King County Metro Transit

**Upcoming Transit Fleet Replacements**

Transit has two upcoming fleets to replace: its trolley fleet and its fleet of 30-foot diesel buses.

Transit operates two trolley fleets: 100 40-foot Gillig trolleys and 59 60-foot Breda Conversion trolleys. The model years assigned to these fleets (2001 and 2002) do not reflect the actual age of the trolleys. The Gillig trolley bodies were supplied in 2001, but the propulsion systems were rebuilt from 1970s trolleys. The Breda Conversion trolleys used bus bodies and propulsion systems from the 1990 Breda dual-powered buses. According to the fleet plan, Transit expects to purchase replacements for the entire trolley system in 2014 and 2015. Transit will begin procurement activity for these purchases in 2011.

The 95 Gillig 30-foot diesel buses entered service between December 1999 and July 2000. According to the fleet plan, Transit expects to purchase replacements for these buses in 2013 and 2014. Transit plans to begin procurement activity for this replacement early in 2011.

Exhibit D summarizes upcoming fleet replacements.

<b>EXHIBIT D</b>				
<b>Upcoming Fleet Replacements</b>				
<b>Bus Type</b>	<b>Units</b>	<b>Manufacturer</b>	<b>Anticipated Replacement Date</b>	<b>Anticipated Start Date for the Procurement Process</b>
60-ft trolley	59	Breda	2015	2011
40-ft trolley	100	Gillig	2014-2015	2011
30-ft diesel	95	Gillig	2013-2014	January 2011

**SOURCE:** King County Metro Transit

### **Audit Scope and Objectives**

The scope and objectives for the performance audit of Transit bus procurement were developed based on our assessment of long-term financial impact at Transit. We evaluated Transit's bus procurement program; determining whether the program successfully delivers quality, cost-effective buses in a timely manner. Our objectives included three phases:

1. For the purposes of evaluating bus procurement success, how should Transit measure quality, timeliness, and cost-effectiveness?
2. Using the measures identified in Objective 1, has Transit been successful in recent bus procurements?
3. What steps can Transit take to increase the likelihood that future bus procurements will be successful?

### **Methodology**

To achieve the objectives noted above, the King County Auditor's Office:

- Interviewed Transit leadership, management, and line staff;
- Interviewed eight bus manufacturers;
- Reviewed Transit documents, particularly existing policies and procedures;
- Performed analyses of Transit data from maintenance, accounting, and other information systems;

- Surveyed relevant industry literature and best practices;
- Consulted with a transit procurement expert on procurement performance measurement;
- Conducted interviews of management and staff at other transit entities.

Transit agencies used for comparative purposes were identified by King County Metro Transit as transit agencies that were similar to them in regard to size, governance, geography, operations, or other factors. We contacted the agencies individually to collect information and in some cases utilized data that these agencies provided to the National Transit Database (NTD).

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

### **Scope of Work on Internal Controls**

We assessed internal controls relevant to the audit objectives. This included review of selected policies, selected performance measures, strategic/comprehensive/business plans, bus procurement standards and processes, and selected staff reports.

In many areas of this audit, we relied on computer-generated data. We tested the reliability of the data using a variety of techniques depending on the data and our purposes. Data reliability testing techniques included evaluating Transit's actions to ensure data reliability, increasing use of corroborating

evidence, and excluding questionable data from analyses. We determined that the data used was sufficiently reliable for our intended purposes.



# 2 BUS PROCUREMENT PLANNING AND PERFORMANCE

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## Chapter Summary

### **Performance Measurement and Continuous Improvement Would Enhance Procurement Success**

Although Transit has informal, high-level goals for individual procurements, it has not set specific strategic procurement goals for bus purchases. We recommend that Transit develop a prioritized set of strategic procurement goals guided by council policy that are fully documented, communicated, and used to guide procurement processes and decisions.

We found that Transit employs a broad stakeholder group in its procurement process and has recently undertaken some updates to policies and procedures. However, the roles and responsibilities of Transit staff in the procurement structure are sometimes unclear and do not facilitate goal achievement. We recommend that Transit address these concerns by undertaking a thorough update of procurement processes and document them in procurement policies and procedures.

In our evaluation of Transit's procurement performance, we found that although Transit evaluates some general performance measures, Transit's measurement of the success of the bus procurement program is limited. We recommend that Transit ensure that planning and monitoring of the bus procurement process encompasses the entire lifecycle of the buses purchased by adopting and systematically calculating a series of performance measures. To ensure that the performance measurement program achieves its objectives, Transit should regularly use information from calculations of these measures, in conjunction with additional data, to develop action plans.

**Strategic Procurement Goals Will Help Transit Focus on Highest Priorities and Minimize Costs**

**Strategic Procurement Goals**

Transit has informal and high-level goals; however, Transit has not yet set strategic procurement goals for bus purchases. This means that they cannot be sure that they are buying buses that meet the county's highest priorities while minimizing costs. For example, buying buses that perform well in snow might conflict with bus seating capacity. Without defining and prioritizing strategic procurement goals for each individual procurement, Transit does not have clear guidance about the type of bus (size, propulsion, fuel system, etc.) or bus specifications (air conditioning, seat quantities, mirrors, etc.) to procure.

Goals are statements that define the basic aims of policies, clearly defining desired outcomes. Exhibit E defines a series of potentially overlapping goal types that we discuss in this section.

<b>EXHIBIT E</b>	
<b>Goal Definitions</b>	
Strategic procurement goals	A set of goals supported by council-approved policy that is formally documented, communicated, and used to guide bus procurement processes and decisions for each individual bus procurement.
Informal procurement goals	An informal set of goals articulated by individuals that are not comprehensive, documented, or formally used to guide individual bus procurement processes and decisions.
Design goals	Goals for the performance of buses to be procured that are formalized in procurement documentation.

**SOURCE:** King County Auditor's Office

Developing strategic procurement goals for each individual bus procurement that are more specific than the informal procurement goals currently used will clarify the purpose and direction for each procurement process and will provide guidance for decisions and tradeoffs. Strategic goals can help unify an organization and ensure its operations are focused on achieving its highest priorities. Developing and prioritizing strategic

procurement goals will promote Transit's procurement of buses that will:

1. Minimize lifecycle cost while incorporating policy goals,
2. Operate the planned service, and
3. Have the highest quality at the lowest lifecycle cost and best value.

Strategic procurement goals could clarify policy expectations and make bus specification choices clearer by prioritizing competing issues such as:

**Competing Issues****Related to Bus****Procurement Should be  
Prioritized**

- Planned maintenance intervals
- Expected lifecycle costs
- Fuel consumption
- Impacts on air quality
- Bus seating capacity
- Bus standing capacity
- Operator ergonomics
- Passenger safety
- Efficiency of boarding and alighting
- Requirements for planned service
- Vehicle comparability to rest of fleet
- Performance in snow
- Noise levels

*Current Transit Goal Setting*

Transit has informal procurement goals; however, these goals do not effectively and specifically guide selection decisions on bus components, sizes, and types needed for each procurement. For example, one Transit staff member identified the following informal procurement goal, "The right specification choices were made based on our desired outcomes in terms of cost, safety, passenger comfort."

Transit includes design goals in its bus procurement RFPs and subsequent contracts with bus builders. An example is a design goal in Transit's contract, "Mean mileage between trouble call incidents shall be greater than 10,000 miles." Transit does not have a basis for this goal, nor a method to enforce its achievement.

**Transit's Existing Goals  
Will Serve as Building  
Blocks for Strategic  
Procurement Goals**

Informal procurement goals and design goals will serve as building blocks in development of strategic procurement goals; however, they are neither consistent throughout the organization nor do they address the full range of goals that might be considered for each individual procurement.

Without a formal set of strategic procurement goals, Transit staff lack clear, consistent direction to ensure procurement decisions reflect agreed-upon county policy. In addition, the process of vetting strategic performance goals is an opportunity for policy decisions regarding procurements to be approved by Transit leadership and county policy-makers. Procurements may not meet broader policy goals set at a county level and policy tradeoffs are made without input from policy-makers.

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**RECOMMENDATION 1**

Transit should develop a prioritized set of strategic procurement goals guided by council policy that are fully documented, communicated, and used to guide procurement processes and decisions.

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**Procurement Processes  
Directly Impact Cost,  
Quality, and Timeliness**

**Procurement Process**

The procurement process directly influences the cost, quality, and timeliness of Transit's buses. The approach to procurement should be efficient with clear roles and responsibilities, while ensuring achievement of strategic procurement goals.

The procurement process begins with development of the RFP for a specified bus. The RFP is advertised and bus manufacturers respond by making requests for deviation. Transit responds to these requests by amending the RFP and calling for initial proposals. The initial proposals are evaluated and additional addenda to the RFP may be generated until Transit invites bus manufacturers determined to be in the competitive range to submit a Best and Final Offer (BAFO). BAFOs are scored and evaluated, and design meetings are held on-site at Transit. Finally, an awardee is selected.

The process involves a range of internal and external stakeholders with differing roles and responsibilities. Key participants include the Transit Fleet Contract Management Group (TFCMG), the Bus Procurement Team (BPT), and Transit management.

Documentation regarding the structure and composition of the BPT differs from Transit's descriptions and our observations of participants in the process. According to documented procedures, the BPT includes more than 40 participants from 14 agency sections, each with a chair assigned to the BPT and in some cases additional members associated with each area. According to procedures, all BPT chairs and sub-group members are responsible for providing input on the RFP, attending meetings, and scoring proposals.

### *Challenges Implementing Procurement Processes*

In practice, the BPT does not function according to all of its written procedures or perform as intended. During our audit, Transit concluded that the current approach to the procurement process has impacted the appropriateness of contracted bus specifications, bus quality, and timeliness of vehicle entry into service. In at least one case, an RFP was advertised and

disseminated to potential proposers prior to gaining input from the BPT on bus specifications and RFP elements; a key responsibility of the BPT. Additionally, according to BPT members and our observations, the roles and expectations are not always clear. Several of the BPT members do not attend meetings, score proposals, or consider themselves part of the BPT. In a proactive investigation of problems on a recent procurement, Transit acknowledged that BPT input was not sufficient and resulted in a vehicle that did not meet Transit's needs and that additional training may be required to ensure that BPT evaluations meet expectations.

There are additional opportunities for Transit management (including the Transit Division management team and the Vehicle Maintenance Section Manager) to guide bus procurement processes by ensuring that strategic procurement goals drive procurement decisions and that agency goals are met. According to procedures, Transit management has a very limited role during the procurement process until the final selection steps, after the BPT has recommended an awardee.

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**RECOMMENDATION 2**

Transit should update procurement policies and procedures, ensuring that the structure of the procurement process efficiently facilitates strategic procurement goals and clarifies roles and responsibilities.

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**Measuring Procurement Success**

Transit's measurement of the success of their bus procurement program is limited. Without effective measurement of the success of the procurement program, Transit and the TFCMG do not have adequate information to demonstrate that an individual bus

procurement was successful or to ensure that future procurements meet the county's goals.

The Transit Cooperative Research Program<sup>3</sup> (TCRP) states that transit entities should measure procurement performance in order to:

- Evaluate and improve organizational performance,
- Achieve larger organizational goals,
- Provide key areas on which staff can focus,
- Develop a culture of self-improvement and accountability,
- Communicate results to stakeholders,
- Instill public confidence, and
- Facilitate oversight.

**Recent Evaluations  
Advise Performance  
Measurement and  
Continuous  
Improvement at  
Transit**

Systematic performance measurement has been a focus of two recent evaluations of Transit, although not of the performance of the procurement process specifically. The Municipal League Foundation of King County's November 2008 report emphasized the need for Transit to use performance measures to foster a culture of continuous improvement and as a basis for setting goals to improve service quality and operate more cost effectively. Our September 2009 performance audit recommended developing goals and methods to measure progress in order to enhance and expand the use of planning across the organization.

*Transit's Measurement Efforts*

Transit staff report that the performance of Transit's bus procurement program and individual procurements has not been systematically measured. Some related measures are regularly calculated and submitted, as required, to the FTA or internally distributed; however, these measures do not provide information

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<sup>3</sup> The TCRP is funded through the Federal Transit Administration (FTA) and provides research and technical support to transit service providers.

sufficient to determine the performance of the procurement program.

In some cases, Transit has established design goals related to bus performance in its contracts; however, it does not measure performance against these goals, many of which are not solely under the control of the manufacturer. The data that Transit does track indicate that these goals may be unrealistic. For example, although the miles between major system failures design goal cited in RFPs for both 40-foot and 60-foot buses is 10,000 miles, in 2009 the fleet wide average miles between major system failures was 5,631.

**Transit Could Pioneer  
Implementation of a  
Procurement  
Performance  
Management Program**

During the course of this audit, we worked with Transit and a transit procurement consultant to develop a set of measures that would effectively measure the performance of bus procurement. It became clear during our research that although the TCRP recommends comprehensive performance measurement, few transit agencies have undertaken such programs in the area of procurement.

The level of Transit's current procurement performance measurement activities appears to be equal to, or in some cases, exceed the activities of other transit agencies. The actions that our audit suggests, if implemented, would set Transit on a course to have a cutting edge procurement performance management system.

Selection and prioritization of a final set of recommended procurement performance measures was based on data availability, potential usefulness, and a full picture of the procurement process and life of the vehicles. The following table summarizes the performance measures that audit staff recommend and Transit agrees are the top priority for implementation at Transit moving forward. Targets have been



identified and measures or proxy measures<sup>4</sup> calculated. The results are discussed in the following chapters related to bus cost, bus quality, and bus timeliness.

<b>EXHIBIT F</b>	
<b>Recommended Bus Procurement Performance Measures</b>	
<b>Category</b>	<b>Recommended Measures</b>
Cost	Purchase Price
	Fleet Wide Capital Costs
Quality	Fleet Defects
	Miles Between Major Systems Failures
	Total Cost of Warranty
Timeliness	Timeliness of Entry into Service

**SOURCE:** King County Auditor's Office, Calyptus Consulting Group

**Recommended  
Procurement  
Performance Measures  
Target Cost, Quality,  
and Timeliness**

The performance measures in this chapter are indicators of bus cost, quality, and timeliness. Transit should use information from calculations of these measures, in conjunction with additional data, to develop action plans to achieve goals related to:

- Determining the fleet size and types needed for upcoming procurements;
- Assessing how Transit's bus specifications and selected options impact prices,
- Collaborating with builders to reduce warranty and fleet defects on future orders of current contracts,
- Evaluating the quality of the builders' performance for consideration during future bus procurements,
- Reviewing and improving Transit inspection processes,
- Negotiating warranty terms in future contracts,
- Improving the efficiency of warranty work done in-house,

<sup>4</sup> In some cases, it was impossible to calculate the ideal performance measure due to unreliable or missing data.

- Evaluating the costs and benefits of continuing to provide particular warranty work in-house rather than requiring the builder or a third party agent to perform the work,
- Planning procurement timelines to meet replacement and service goals, and
- Working with bus builders to identify workable procurement and delivery schedules.

**Performance Targets  
Should Be Both  
Reachable and Keep  
Transit Striving for  
Higher Performance**

Developing an effective system of performance measures is a process that requires regular review and refinement to ensure that the measures meet the intended objectives and that the targets set are neither unreachable, nor keep the agency from stretching for higher performance.

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**RECOMMENDATION 3**

Transit should conduct and document annual retrospective processes to calculate and evaluate procurement performance measures and should develop action plans to improve outcomes; these processes should also consider the effectiveness of the measures and targets, and revisions that may make them more effective.

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# 3 COST IMPACTS OF BUSES PURCHASED

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## Chapter Summary

### **Transit Should Collect and Analyze Data to Ensure Bus Lifecycle Costs Are Minimized**

There are several elements of Transit operations that contribute to bus ownership costs over the full lifecycle of the bus. These include capital costs, operating costs, and maintenance costs. Transit has been successful in some areas of cost management, such as bus purchase prices and effective use of large buses. However, Transit has opportunities to improve by collecting and analyzing data to ensure that they are minimizing bus lifecycle costs at the same time that they meet county policy goals.

This chapter is broken into two sections, each addressing the cost impacts of buses that Transit purchases. First, we calculate two performance measures that are indicators of cost impacts: purchase price and fleet wide capital costs. Second, we discuss Transit's approach to determining which size and type of buses to purchase.

### **Transit Paid a Lower Price for Buses Than the Average Price Paid in Our Industry Survey**

In calculating purchase price, we found that Transit's purchase price estimates were within 10 percent of eventual costs for three quarters of the procurements reviewed. In addition, we found that Transit paid a lower price for its buses than the average price paid in our industry survey. In our calculation of Transit's fleet wide capital costs, we found that in comparison to other transit agencies we surveyed, Transit has a higher proportion of higher cost buses; however, it generates more passenger miles per bus. This suggests that Transit is effectively using larger buses to move passengers.

We determined that Transit does not currently have a comprehensive documented method to determine if they are

purchasing the right size and type of buses to most effectively and efficiently deliver the potential range of future service levels that may occur. We also found that the 60-foot buses that Transit has purchased are more costly in regard to purchase price and maintenance and are less reliable than smaller buses. It is challenging to plan bus fleet purchases into the future due to uncertain economic conditions. Transit revenue, ridership, and service quality factors must all be considered when planning for future fleets. We recommend that Transit quantify and analyze the costs and benefits of the full array of bus types capable of delivering Transit's potential range of future service.

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## CALCULATION OF PERFORMANCE MEASURES

Two performance measures indicating the cost impacts of Transit's bus purchases were selected for calculation: purchase price and fleet wide capital costs. As noted in Chapter 2: Bus Procurement Planning and Performance, both performance measures and targets will need to be continually reassessed and updated to ensure ongoing relevance.

### Purchase Price

#### **Regularly Conducting Purchase Price Analysis Can Show How Procurement Decisions Impact Prices**

This performance measure is the purchase price Transit pays for a bus. Purchase price can be tracked and compared against internal and peer procurements over time. Comprehensive analysis of this measure may indicate how Transit's customized specifications (specified seating configurations or towing capabilities, for example) and selected bus options (such as air conditioning) impact prices.

The Federal Transit Administration (FTA) cautions transit agencies to focus on drafting specifications that meet the agencies' minimum needs, rather than specifications that "push the state of the art to a new level, to have the best possible

system, regardless of cost.” Not only do custom specifications inflate prices directly, they also limit competition. Full and open competition, according to the FTA, is the primary way to obtain the best quality buses at the lowest possible price.<sup>5</sup>

In accordance with federal requirements,<sup>6</sup> Transit develops an independent cost estimate (ICE) prior to each bus solicitation based on current market pricing and potential bus features. The ICE serves as the pricing target for the solicitation, as well as a useful performance target.

#### *Purchase Prices on Current Transit Fleet*

The following table shows the difference between the estimates Transit prepared and its ultimate purchase price paid.<sup>7</sup>

**EXHIBIT G**  
**Purchase Price on Transit's Fleet<sup>8</sup>**

Manufacturer	Fleet Type	Model Year	Purchase Price	ICE	Difference Between ICE and Purchase Price
New Flyer	60-foot hybrid	2008	\$734,072	\$798,000	-8.7%
New Flyer	60-foot hybrid	2009	\$734,072	\$798,000	-8.7%
New Flyer	60-foot hybrid	2004	\$639,327	\$636,596	0.4%
New Flyer	60-foot diesel	2004	\$438,026	\$454,278	-3.7%
New Flyer	40-foot diesel	2003	\$283,417	\$275,000	3.0%
Gillig	40-foot trolley (body)	2001	\$271,083	\$250,000	7.8%
Gillig	30-foot diesel	1999	\$222,000	\$214,245	3.5%
Champion	25-foot diesel van	2002	\$71,724	\$73,560	-3%

**SOURCE:** King County Auditor's Office and King County Metro Transit

#### **All of Transit's Purchase Prices Were Within Ten Percent of Estimates**

All of the purchase prices we reviewed were within 10 percent of the ICE. A target of seven percent – or lower – for this performance measure is reasonable for future Transit procurements.

<sup>5</sup> FTA, *Best Practice Procurement Manual* (2001), Chapter 3, p. 2.

<sup>6</sup> FTA Circular 4220.1F, Ch. VI, Para. 6.

<sup>7</sup> Transit was unable to produce the ICEs for the 1994 and 1996 contracts.

<sup>8</sup> This table does not include the 59 Breda trolleys Transit converted from dual mode. The purchase price listed for the 100 Gillig trolleys is for the bus body only.

As the table shows, the main determining factor on purchase price is bus length. Generally speaking, the longer the bus, the greater the purchase price. Adding hybrid drive also adds to the purchase price. 60-foot hybrid buses are currently the most expensive buses to purchase.<sup>9</sup>

#### *Industry Comparison of Purchase Price*

In addition to comparing purchase prices against ICEs, Transit can make comparisons with other transit agencies to track this performance measure. Although King County Transit specifications are not identical to those of other agencies, the metric can be useful in determining whether there are large gaps between Transit and other agencies. Such gaps might lead Transit to analyze its specification in comparison to the specifications used by others to determine where the decisions they made regarding specific features and subsystems have led to increased costs.

Auditors collected peer data on five bus types: 30-, 35-, 40-, and 60-foot diesels; and 60-foot hybrids. On all but one of the procurements for the current fleet, Transit paid less than the average purchase price across the industry survey. Differences ranged from 14 percent less than average price to less than one percent more than average. Exhibit H arranges the procurements by difference from average purchase price.

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<sup>9</sup> Preliminary industry data appears to demonstrate that trolley prices will exceed the cost of hybrid buses. However, Transit's two current fleets of trolleys are not purchases of complete buses, so they could not be used for comparison here.

<b>EXHIBIT H</b> <b>Transit Purchase Price Compared to Average Industry Purchase Price</b>				
<b>In-Service Year</b>	<b>Bus Type</b>	<b>Average Purchase Price (in 2009 \$)</b>	<b>King County Paid (in 2009 \$)</b>	<b>Difference</b>
2000	60-Foot Diesel	587,805	507,409	-13.68%
1998			523,276	-10.98%
2004			530,695	-9.72%
2008	60-Foot Hybrid	817,525	746,872	-8.64%
1998	40-Foot Diesel	365,190	337,190	-7.67%
2004	60-Foot Hybrid	817,525	774,583	-5.25%
1996	40-Foot Diesel	365,190	350,150	-4.12%
1999	30-Foot Diesel	313,989	302,396	-3.69%
2003	40-Foot Diesel	365,190	362,069	-0.85%
1997	35-Foot Diesel	341,174	341,328	0.05%

**SOURCE:** King County Auditor's Office and King County Metro Transit

### **Fleet Wide Capital Costs**

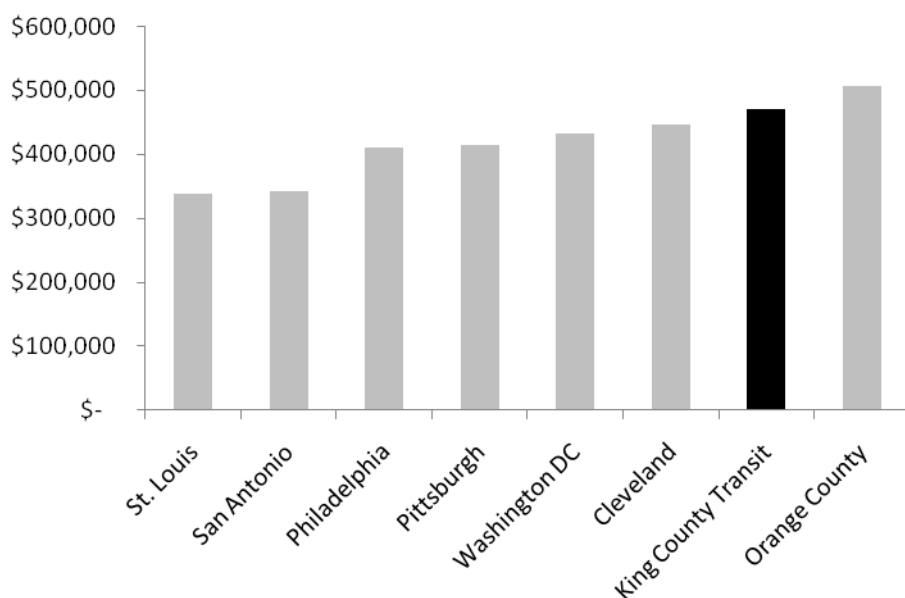
The four calculations we use to measure Fleet Wide Capital Costs compare the costs of the entire Transit bus fleet to other agencies' bus fleet costs. The previous section compares Transit's purchase prices with other transit agencies for similar buses; however, it does not measure how the costs of the entire fleet compare to that of other agencies. Many of Transit's purchases involve complex and costly vehicles compared to the continuum of vehicle options. This section includes a set of measures to evaluate, from a fleet wide perspective, how Transit fleet mix decisions affect fleet wide capital costs. Transit and policy-makers can use this data, in concert with other information, to determine if these tradeoffs meet policy goals. This section also includes measures to assess how efficiently Transit utilizes its fleet.

*Fleet Wide Average Capital Cost per Bus*

This measure, expressed in 2009 dollars, adds the purchase price for all of the buses in the fleet and divides by the total number of buses in the fleet.<sup>10</sup> Transit's average cost per bus is \$470,715.

Exhibit I illustrates that Transit's fleet overall is relatively more costly, per bus, than most of the comparison transit agencies. In reviewing the other agencies' fleets, we observed that Transit has a higher proportion of more costly 60-foot buses and hybrid buses than most of the agencies included in the comparison.

**EXHIBIT I**  
**Calculation of Capital Cost Performance Measures:**  
**Fleet Wide Average Capital Cost per Bus**



**SOURCE:** King County Auditor's Office

The following three measures compare the *annualized fleet wide capital cost*<sup>11</sup> with annual revenue miles, revenue hours, and passenger miles.

<sup>10</sup> Trolleys are not included in this analysis.

<sup>11</sup> Annualizing the fleet wide capital costs amortizes the costs over the life of the buses.

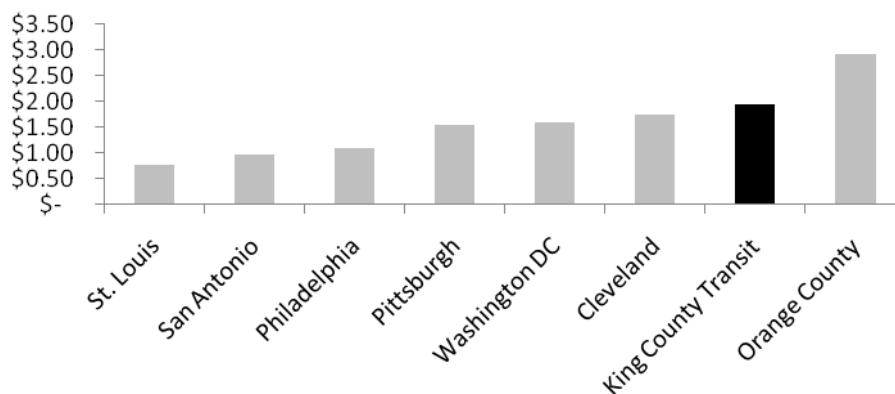


*Fleet Wide Annualized Capital Cost per Revenue Mile<sup>12</sup>*

This measure divides an annualized cost of the fleet by the 2008 revenue miles traveled by the fleet. The measure provides information on both the relative cost of the fleet and how intensively the fleet is utilized.

Exhibit J below shows that Transit's fleet wide annualized capital cost per revenue mile is higher than all but one of the comparison agencies.

**EXHIBIT J**  
**Calculation of Capital Cost Performance Measures:**  
**Fleet Wide Annualized Capital Cost per Revenue Mile**



**SOURCE:** King County Auditor's Office

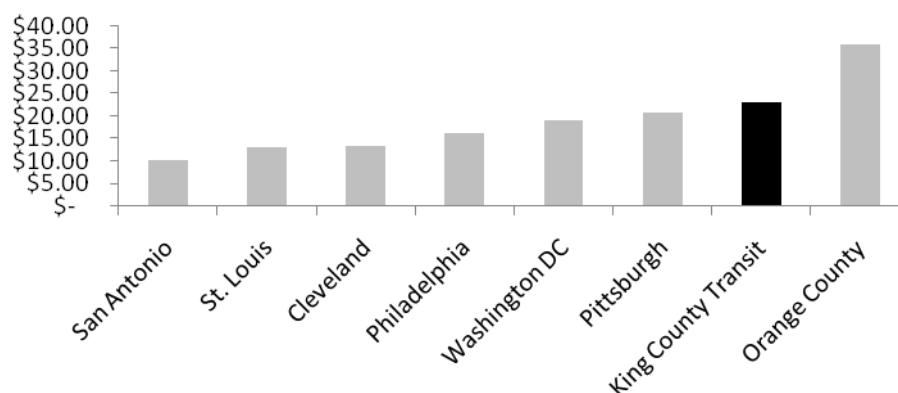
*Fleet Wide Annualized Capital Cost per Revenue Hour<sup>13</sup>*

This measure divides the annualized cost of the fleet by the 2008 service hours provided by the fleet. Exhibit K illustrates that Transit's annualized capital cost per revenue hour is also higher than most of the agencies in the comparison. The difference is largely explained by the higher average cost of Transit's fleet, rather than Transit getting fewer service hours per bus.

<sup>12</sup> Revenue miles represent miles travelled when the bus is in service and there is an expectation of carrying passengers.

<sup>13</sup> Revenue hours represent hours travelled when the bus is in service and there is an expectation of carrying passengers.

**EXHIBIT K**  
**Calculation of Capital Cost Performance Measures:**  
**Fleet Wide Annualized Capital Cost per Revenue Hour**

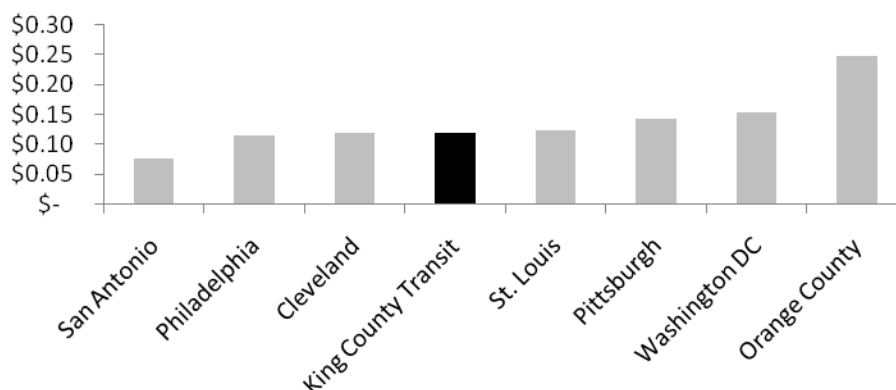


**SOURCE:** King County Auditor's Office

*Fleet Wide Annualized Capital Cost per Passenger Mile*

This measure divides the annualized cost of the fleet by the number of 2008 passenger miles. Exhibit K above showed that Transit's fleet wide average capital cost per bus is above average. Exhibit L illustrates that fleet wide annualized capital cost per passenger mile is very close to the average of the agencies in the comparison group. Given that Transit's higher than average capital cost per bus is due in part to its extensive use of larger buses, it should be expected that fleet wide average passenger miles per bus is above average. The higher than average capital costs per bus combined with the higher than average passenger miles per bus results in Transit's fleet wide average cost per passenger mile being about average. Together, these measures indicate that Transit is effectively using their large buses to move passengers. This may provide some justification for Transit's decisions to utilize larger buses. However, San Antonio has the lowest fleet wide annualized capital cost per passenger mile, and it uses smaller 40-foot buses exclusively.

**EXHIBIT L**  
**Calculation of Capital Cost Performance Measures:**  
**Fleet Wide Annualized Capital Cost per Passenger Mile**



**SOURCE:** King County Auditor's Office

## DETERMINING THE RIGHT TYPE AND SIZE OF BUSES TO PURCHASE

Because Transit has not completed a comprehensive analysis of its fleet mix to determine what the most cost-effective fleet might be to accomplish the potential range of future service, Transit may not be purchasing the optimal buses in terms of number of buses and capacity to most effectively and efficiently deliver the range of potential service. Service requirements could be met in more than one way and there are tradeoffs to be considered in capital costs, operating costs, maintenance costs, ridership, and other issues.

### Current Transit Efforts to Determine Fleet Needs

Transit's 2007-2016 strategic plan includes language that states plans to increase the number of hybrid buses over diesels, replace high floor with low floor buses, and increase entry/exit doors on the Bus Rapid Transit (BRT) fleet. Although Transit informally considers the fleet needs through a comparison of existing fleet with potential changes using parameters such as number of seats, full analysis of alternatives is needed. For example, Transit made a decision to increase the fleet's proportion of articulated 60-foot buses based on an assumption

**It Is Unclear Whether  
Transit's Decision to  
Buy Longer Buses Most  
Cost-Effectively  
Delivers Potential  
Future Service**

**Transit's Decision to  
Employ Five-Year  
Contracts Will Enable  
It to Respond to  
Changing Fleet Needs  
More Quickly**

that increasing ridership levels coupled with Transit's seating capacity reductions on low floor buses warranted larger buses, but did not definitively determine that the larger buses would be the most appropriate and cost effective to deliver the potential range of future service.

It is challenging to plan bus service into the future with a degree of certainty. Factors such as the regional economy and urban growth trends impact ridership in different areas, and thus service and fleet needs. One strategy that Transit is utilizing to respond to fluctuations in service needs is the use of a new five-year contracting approach. Transit is able to make more frequent, smaller orders of buses and can respond more quickly to changing service needs. Transit's new approach makes procurement cycles more regular and fleet planning more predictable, enabling Transit to adjust fleet purchases to changing fleet needs.

Transit is in the process of developing service guidelines that, in addition to other functions, will provide criteria for the development and evaluation of service and provide minimum performance expectations for all service types. The guidelines may be able to provide support for analysis of tradeoffs using a variety of fleet options to meet the potential range of future service. For example, the guidelines will discuss bus loading targets and max loads and vehicle utilization standards. This document is planned to be included in the update to the Comprehensive and Strategic Plan for Public Transportation in Spring 2011.

**Differing Costs of Short vs. Long Buses**

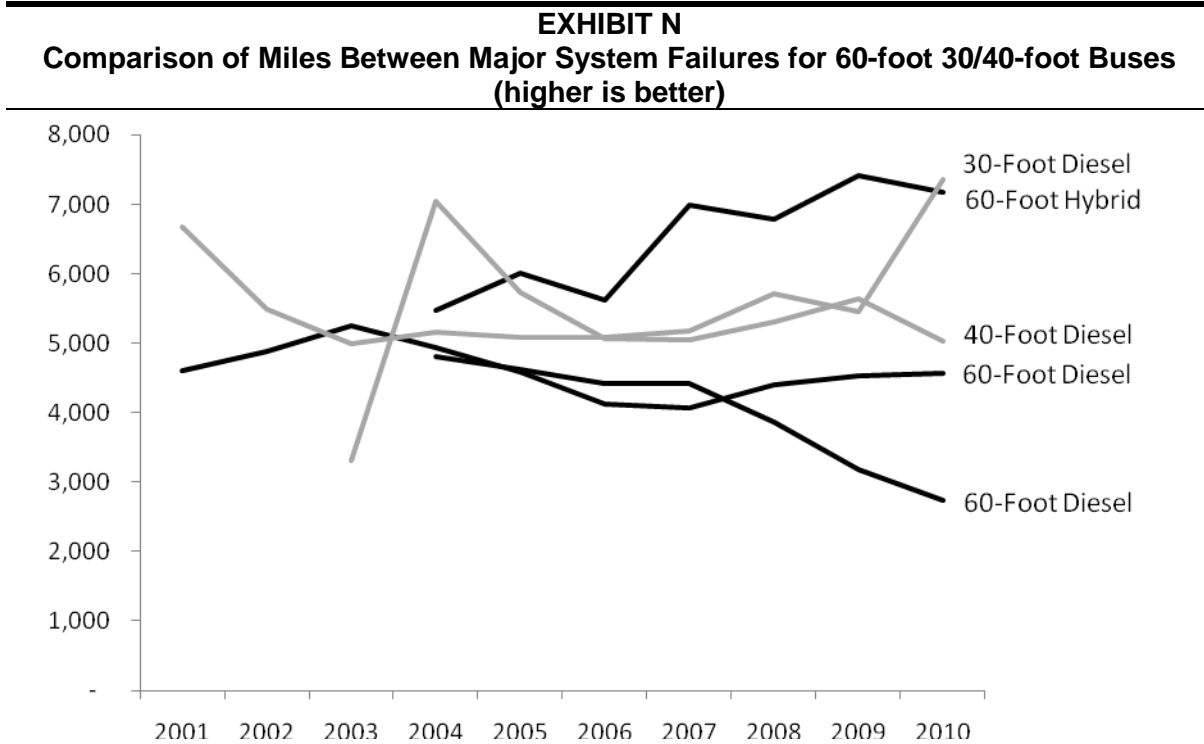
The data gathered during calculation of performance measures suggests that longer buses may result in higher administrative and maintenance costs and lower reliability over the life of the

vehicles and are more expensive to purchase than shorter buses. Purchase and maintenance costs are expressed in 2009 dollars in the table below.

<b>EXHIBIT M</b>		
<b>Comparison of Performance in Shorter vs. Longer Buses</b>		
	<b>30/40-foot Buses</b>	<b>60-foot Buses</b>
Included Fleets	1999 Gillig 30-foot Diesel 2003 New Flyer 40-foot Diesel	1999 New Flyer 60-foot Diesel 2004 New Flyer 60-foot Diesel 2004 New Flyer 60-foot Hybrid
Purchase Price	\$300,000 to \$360,000	\$500,000 to \$775,000
Fleet Defect Average (lower is better)	19	70
Warranty % of Purchase Price (lower is better)	1.2% to 2.1%	4.4% to 4.6%
Miles Between Major Systems Failures (higher is better)	5,443	5,033

**SOURCE:** King County Auditor's Office

Exhibit N shows that, with the exception of the 2004 New Flyer 60-foot Hybrid vehicles, shorter buses have been in service for greater distances before incurring a failure in a major system. There are many factors in addition to vehicle length and bus type that influence maintenance costs, including the characteristics of the route.



**SOURCE:** King County Auditor's Office

**The Cost of Operating  
More Small Buses  
Should Be Weighed  
Against the Higher Cost  
of Purchase and  
Maintenance and  
Lower Reliability of  
Larger Vehicles**

There are costs and benefits to utilizing different fleet sizes and types that include tradeoffs to be considered in capital costs, operating costs, maintenance costs, ridership, bus base parking capacity, and other issues. The cost of operating additional vehicles that might be required using more smaller buses needs to be weighed against the higher cost of purchase, administration, and maintenance and lower reliability over the life of 60-foot vehicles. Transit could model these tradeoffs by considering data that they currently have or is being developed including ridership projections; routes and schedules; loading standards; capital, maintenance, administrative, and operating costs; and other related data. Transit could also utilize software<sup>14</sup> to support this analysis, some of which they already own. This analysis will be complex, will take time, and will involve multiple

<sup>14</sup> Transit currently owns a software system, HASTUS, which assists in transit management. It is a large system with multiple modules that work together to address different tasks and problems. Two modules that Transit does not currently own, NetPlan and Rider, could, in combination with modules that Transit does own, support the analysis of fleet alternatives.

sections within Transit including management teams, service planning, service scheduling, the procurement group, and vehicle maintenance. In addition, county policies and service planning should be considered when determining the appropriate fleet mix.

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**RECOMMENDATION 4**

Transit should fully analyze the costs and benefits of an array of fleet alternatives that could deliver the potential range of future service and meet strategic goals before making final procurement decisions.

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# 4 QUALITY OF BUSES PURCHASED

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## **Chapter Summary**

Transit has instituted several bus quality assurance practices; however, implementing retrospective reviews of quality performance indicators and strengthening inspection frameworks and practices will help Transit identify strategies to increase bus quality.

This chapter is broken into two sections, each addressing the quality of Transit's buses. First, we calculate three performance measures that are indicators of bus quality: fleet defects, cost of warranty, and miles between major system failures. Second, we discuss Transit's approach to ensuring quality through bus inspection prior to acceptance from the manufacturer.

## **Enhancing Bus Quality Will Reduce Costs**

The quality of Transit's buses directly impacts cost. In calculating fleet defects and the cost of warranty, we found that, in general, Transit's fleet of larger buses had a higher number of defects and higher warranty costs. We also found that although Transit's vehicles are below the national average for miles between major system failures, Transit's performance in this area is improving and moving closer to the national average.

In reviewing the methods of inspection that Transit utilizes to ensure bus quality throughout the procurement process, we found that Transit has continued historical on-site inspection practices without formally evaluating differing approaches or considering Transit's economic environment at the time of the procurement. Transit should estimate and compare the full cost and anticipated benefits of utilizing Transit staff to conduct on-site bus inspections vs. contracting out this service and

document the decision for each bus procurement. In addition, Transit can improve its guidance for bus inspection and should update procurement inspection policies and procedures, to reflect a rigorous approach to all phases of the inspection process and defining specific methods to achieve quality and accountability.

As noted in Chapter 2: Bus Procurement Planning and Performance, both performance measures and targets will need to be continually reassessed and updated to ensure ongoing relevance.

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## **CALCULATION OF PERFORMANCE MEASURES**

Three performance measures indicating bus quality were selected for calculation: fleet defects, cost of warranty, and miles between major system failures. Fleet defects and cost of warranty, the first two performance measures, measure quality issues that occur only during the warranty period<sup>15</sup> defined in the contract for affected components. The drawback to this measurement approach is that these two performance measures will not capture quality problems that occur outside of the warranty period. However, using warranty-related performance measures is useful since the cause of a warranty problem is explicitly tied to the manufacturer and the data is readily available, since Transit already tracks it for other purposes (for example, reimbursement and repair).

### **Fleet Defects**

Transit defines a fleet defect as a warranty claim that occurs in 20 percent or more of a given fleet. This results in the

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<sup>15</sup> The most recent bus purchase contract (July 2009) establishes warranty periods of two years or 200,000 miles for the engine; two years or 100,000 miles hybrid drive, transmission, and drive axle; one year or 50,000 miles for the brake system; two years and unlimited mileage for the air conditioning system; three years or 150,000 miles for the basic body structure; and seven years or 350,000 miles for structural integrity corrosion.

manufacturer providing parts and paying for labor to resolve the defect in not only the 20 percent of the fleet in which the defect has occurred, but also for the remaining 80 percent of the fleet. Fleet defects are an indication of the overall quality of the vehicles purchased under a given contract; a lower number of fleet defects point to higher bus quality. As the number of Transit's claims related to fleet defects increases, several other areas of costs will likely be impacted including timely entry of the vehicle into service, miles between maintenance actions, unscheduled maintenance, vehicle downtime, and maintenance labor hours.

**A Low Number of Fleet  
Defects Points to  
Higher Bus Quality**

Fleet defects can involve major fleet components, such as fuel pumps and alternators, or they can involve accessories, such as exterior side mirrors and microphone necks. Fleet defects may or may not impact Transit's service. For some defects, the vehicles may need to be pulled from service and replaced with another vehicle while the problem is being resolved. In other cases, the defect could be fixed during other routine maintenance on the vehicles.

The target associated with this measure will differ for fleets in different phases of their lifecycle and will shift over time as Transit has the opportunity to implement processes that will reduce the number of fleet defects. Transit and the auditors agree that the quality of Transit's vehicles can be enhanced by setting aggressive targets for future fleets in comparison to the number of fleet defects incurred in current fleets. Since this performance measure is not yet measured across the transit industry, the initial targets were set in collaboration with Transit. There should be a trend toward zero fleet defects.

**EXHIBIT O**  
**Performance Targets for Fleet Defects**

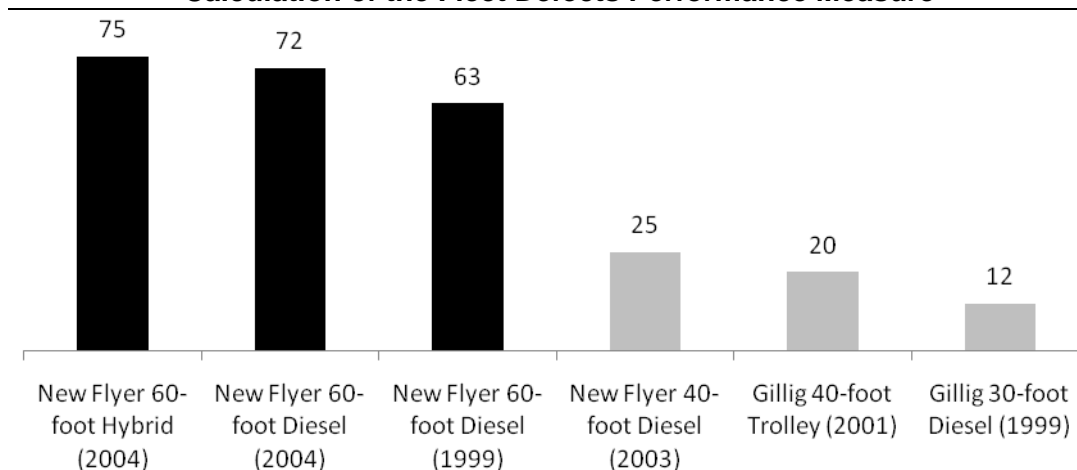
<b>Fleet Status</b>	<b>Fleets to Which Target Applies</b>	<b>Initial Target</b>
Fleets currently in service and in the active warranty period.	2008 New Flyer 60-foot Hybrids	< 5% increase in the current number of fleet defects
Fleets not yet in service.	2008 StarTrans 27-foot Vans 2010 New Flyer 60-foot Hybrids 2010 BRT New Flyer 60-foot Hybrids	< 10 fleet defects
Fleets currently in production or purchased in the future.	Daimler 40-foot Diesels Other	< 5 fleet defects

**SOURCE:** King County Auditor's Office and King County Metro Transit

**Transit's 60-Foot Buses Have More Fleet Defects**

The chart below shows a high number of fleet defects occurring in the 2004 New Flyer 60-foot diesel and hybrid buses and the 1999 New Flyer 60-foot diesel bus.

**EXHIBIT P**  
**Calculation of the Fleet Defects Performance Measure<sup>16</sup>**



**SOURCE:** King County Auditor's Office

<sup>16</sup> Because Transit was not able to provide the data, we could only calculate the number of fleet defects in approximately 60% of the fleets currently in service. Some of the current fleet entered service before electronic tracking systems began to be employed in 1999, were internal projects that did not involve a bus builder in the same way as a usual fleet, or warranty was handled outside of Transit's warranty process because of builder restrictions. In addition, we excluded the 2008 New Flyer 60-foot hybrids because they are still in the warranty period and the data is not complete.

**Calculating Warranty  
Costs Can Identify  
Quality Problems  
Stemming From Builder  
or Inspection Problems**

**Total Cost of Warranty**

Warranty repairs for a fleet are an indication of quality problems and may lead to significant additional costs to Transit related to maintenance and warranty administration. Similar to fleet defects, the total cost of warranty may identify problems related to bus builder quality and/or the quality of Transit's inspection processes before accepting the bus from the builder.

Rather than measuring the total cost of warranty alone, this performance measure accounts for the different sizes of fleet cohorts by looking at warranty costs as a percentage of fleet cost.

Warranty costs can be measured in three overlapping ways:

**1. Full Warranty Costs**

Full warranty cost is the full cost to Transit of resolving bus deficiencies that are under warranty. For each warranty claim, this would include the full costs related to:

- Warranty administration hours spent resolving the issue,
- Mechanic hours spent resolving the issue, and
- All parts used to resolve the warranty issue.

There may be additional costs related to towing and replacement if the vehicle breaks down while in service.

**2. Billed Warranty Costs**

Billed warranty costs are a portion of the full warranty costs. These are the subset of full costs related to warranty claims that Transit is allowed under the contract to bill the builder. This differs from full warranty costs in that Transit may be constrained to billing for a set number of hours for a warranty repair, while actual repair hours exceeded that.

### 3. Recovered Warranty Costs

Recovered warranty costs are a portion of billed warranty costs. This is the amount that Transit ultimately receives from the builder for a warranty claim. Transit may recover a lower amount from builders due to differing interpretations of contract language or failure of the builder to take responsibility for a warranty problem.

#### **Adjusting Data Collection Will Allow Transit to Effectively Calculate Full Warranty Costs**

Although full warranty cost is the best measure of the impact of warranty issues on Transit, Transit does not currently collect its warranty information in this way. Transit does have data available on billed warranty costs and recovered warranty costs.

The target associated with this measure will differ depending on whether the fleet is part of a multiple year contract and on Transit's readiness to collect and calculate data for the full cost of warranty. Targets will also shift over time as Transit has the opportunity to implement processes that will improve the quality of the vehicles. Since this performance measure is not yet measured across the industry, the initial targets were set in collaboration with Transit with the goal of a gradual trend toward zero.

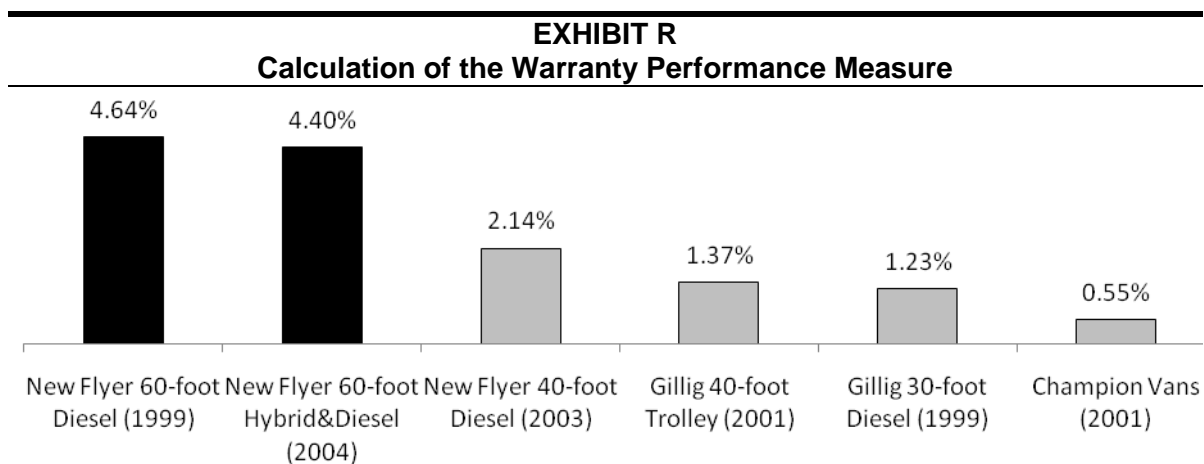
<b>EXHIBIT Q</b>	
<b>Performance Measure Targets for Total Cost of Warranty</b>	
<b>Performance Measure</b>	<b>Initial Target</b>
Recovered Warranty Costs	< 2% of the purchase price
Full Warranty Costs	< 4% of the purchase price
Warranty of Future Orders on Current Contracts <sup>17</sup>	10% reduction in warranty costs for future orders of this contract

**SOURCE:** King County Auditor's Office and King County Metro Transit

<sup>17</sup> This target applies to the 2010 New Flyer 60-foot hybrids and the 2010 BRT New Flyer 60-foot hybrids.

### Transit's 60-Foot Buses Have Higher Warranty Costs

The following chart shows recovered warranty as a percentage of purchase price.<sup>18</sup> The chart shows that the 1999 and 2004 New Flyer 60-foot diesel and hybrid buses have higher warranty amounts billed and recovered.



**SOURCE:** King County Auditor's Office

### Calculating Miles Between Major System Failures Can Help Identify Bus Quality Problems

#### Miles Between Major System Failures

A major system failure is a failure of a mechanical component of the bus that impacts its movement or is taken out of service because of safety concerns.<sup>19</sup> A longer distance between failures may indicate that the procurement process resulted in a bus in which major mechanical systems work well together, a quality final product, and lower maintenance costs.

The target for this measure is greater than 7,000 miles between failures. The target was set based on the national average data provided in the *National Transit Summaries and Trends for the 2008 National Transit Database Report Year: November 2009*.<sup>20</sup>

<sup>18</sup> The Breda conversion vehicles do not qualify for warranty since they were built by Transit and are not included here. Warranty reimbursements received from builders for the 2004 New Flyer 60-foot diesel fleet and the 2004 New Flyer 60-foot hybrid fleets purchased at the same time are not tracked separately, so they are reported together for warranty but separately for maintenance costs. In addition, we excluded the 2008 New Flyer 60-foot hybrids because they are still in the warranty period and the data is not complete.

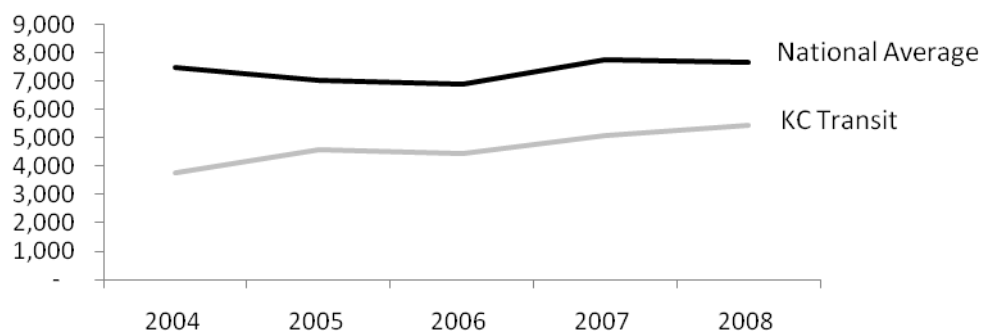
<sup>19</sup> NTD states that major bus failures relate to a major mechanical system necessary for the continued safe operation of the bus, for example, breakdowns of air equipment, brakes, doors, engine cooling system, steering and front axle, rear axle, and suspension and torque converters.

<sup>20</sup> Different agencies use varying criteria to define what constitutes a major mechanical failure. The use of the national average may help eliminate some of this potential disparity even though the data is reported across all propulsion types.

**Transit's Miles Between  
Major System Failures  
Has Been Moving  
Toward the National  
Average**

This chart shows the trend in Miles Between Major System Failures (MBMSF) for King County Transit's entire fleet and how King County's number compares to the national average (a higher number is desirable).<sup>21</sup> On average, other agencies' transit vehicles operate for more miles before a major system fails than Transit's vehicles. However, Transit's MBMSF has been improving over time and the gap between Transit and the national average has been shrinking.

**EXHIBIT S**  
**Calculation of Miles Between Major System Failures**  
**Performance Measure for All Buses**

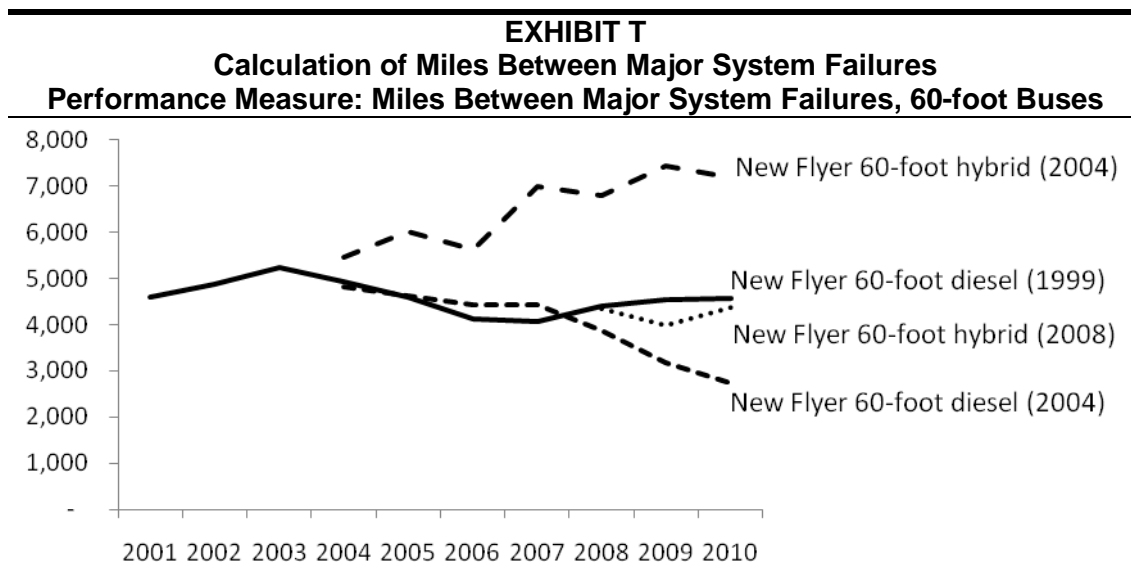


**SOURCE:** King County Auditor's Office

The chart below compares the miles between major system failures for Transit's fleet of 60-foot buses. The most comparable bus fleets both went into service in 2004 with the primary difference being the hybrid vs. diesel propulsion systems. The 2004 hybrid has been more reliable than the diesel. Transit states that this is because the diesel buses are being used for inner-city routes, resulting in greater wear on several components. The 2008 hybrid has not performed comparably in miles between major systems failures in its first two years in service. Transit indicates they are taking actions to improve the reliability of the 2008 hybrid fleet.

<sup>21</sup> The system wide average calculated by Transit includes both King County Transit fleets and fleets Transit operates on behalf of Sound Transit.





**SOURCE:** King County Auditor's Office

## TRANSIT'S INSPECTION ACTIVITIES

### Enhancing Inspection Frameworks and Practices Will Help Transit Improve Bus Quality

Inspections are critical quality assurance points in the bus procurement process. Discovering a deficiency in a bus when it is still early in the manufacturing process can save Transit, and bus manufacturers, millions of dollars. For example, if a missing bolt is discovered on the manufacturing line it can be corrected right away instead of being discovered when the bus is in service in King County. In this case, Transit may incur costs related to taking the bus out of service; replacing the bus during its down time; mechanic time diagnosing and repairing the deficiency; administrative time coordinating switch-outs and capturing warranty recovery; and any parts required.

When Transit purchases buses, inspections occur at multiple points in the procurement process, each contributing to the ultimate quality of Transit's vehicles.

#### 1. Inspection of Prototype Bus

Once a builder has been selected and a contract signed, a prototype bus is built to Transit's specifications. Usually, but

not always, this prototype bus is provided to Transit for their inspection before the full fleet production begins.

## **2. Rolling On-Site Inspection**

During the production of the full fleet, a team of inspectors from Transit travel to the manufacturing site(s). They are responsible for observing the production process; coordinating with the manufacturer's quality assurance team; and ensuring that the buses being built fully comply with the requirements in the contract.

## **3. Pre-Delivery Inspection**

The pre-delivery inspection is a formal, full evaluation of each bus that is conducted by the on-site inspection team that must be completed before the manufacturer is authorized to deliver a bus to Transit.

## **4. Pre-Acceptance Inspection**

Once the bus arrives at Transit, a final inspection of the vehicle is conducted by Transit staff before accepting the bus from the builder.

### **Transit's On-Site Inspection Team**

Of the four bus inspection opportunities, Transit invests the most resources in its on-site inspection. From 2000-2010 Transit has spent \$3.4 million on on-site inspection travel reimbursement.

This does not include inspector salaries and benefits, work equipment, etc. The following table shows the costs of on-site inspection travel reimbursement for different fleets over the past ten years. Some of the factors that can impact the cost of on-site inspection include variation in travel and living costs at the manufacturing site, the length of time to manufacture the particular bus, the quantity of buses contracted for, the number of individual orders placed on the contract, and the inspection team members' choice to utilize opportunities to return home or not. For example, in the table below, the on-site inspection travel

reimbursement costs for the 2008 New Flyer 60-foot hybrid buses are especially high because New Flyer has two plants, one in Canada and two in Minnesota, and the contract has included three separate orders.

<b>EXHIBIT U</b>		
<b>Cost of Travel Reimbursements for On-Site Inspection for Each Fleet<sup>22</sup></b>		
<b>Fleet</b>	<b>Cost of On-Site Inspection Travel</b>	<b>Number of Buses Ordered</b>
1999 Gillig 30-foot Diesel	\$98,948	95
2002 Champion 25 Foot Vans	\$37,835	34
2001 Gillig 40-foot Trolley	\$337,635	100
2003 New Flyer 40-foot Diesel	\$224,698	100
2004 New Flyer 60-foot Hybrid/Diesel	\$685,992	242
2008 New Flyer 60-foot Hybrid	\$876,453	73
StarTrans 27 Foot Vans	\$167,417	35

**SOURCE:** King County Metro Transit

Transit has utilized their own staff to conduct on-site inspections for more than 30 years. A team between one and eight inspectors, most of whom are Transit mechanics with more than 20-years experience, travels to the manufacturer's production location and work on-site for the duration of the production process. Bus manufacturers with whom we communicated noted that Transit's on-site inspection teams are highly capable and effective and in some cases had assisted the bus manufacturer in making improvements that were incorporated into future bus builds.

Transit has continued historical on-site inspection practices without formally evaluating differing approaches to satisfying the FTA requirement to have inspections completed on-site during

<sup>22</sup> This amount does not reflect salary costs for on-site inspectors during their on-site work or the cost of backfilling the tasks to which these staff are usually assigned.

the building of the bus, and considering Transit's economic environment at the time of the procurement. Many transit agencies contract out the on-site inspection role or use a mix of contracted and agency staff at a much-reduced cost. Sound Transit has utilized Transit's on-site inspection services in the past, but has now decided to contract out the service.

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## RECOMMENDATION 5

For each bus procurement, Transit should estimate and compare the full cost and anticipated benefits of utilizing Transit staff to conduct on-site bus inspections versus contracting out this service and document the decision.

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### **Inspection Procedures Help Create a Formal, Proactive Environment that Encourages Standardized Performance**

#### **Inspection Guidance**

Documented policies and procedures help an organization ensure work is conducted consistently and supports the department's mission and goals. Policies and procedures also establish guidelines and expectations for both employees and stakeholders. John Dolce, in his book *Analytical Fleet Maintenance Management*, states that "We are looking for demonstrated control—a formal proactive environment that encourages standardized performance."<sup>23</sup> He also notes that all inspections should be conducted by qualified staff utilizing a form that identifies specific inspection steps.<sup>24</sup>

Transit has not updated its policies and procedures relating to procurement since 2006, and we found several occurrences of out-of-date directives. Transit's existing procurement procedures relating to inspections do not provide adequate guidance for inspectors. While Transit has pre-delivery, pre-acceptance, and prototype inspection forms, many of these documents do not provide specific direction regarding elements to inspect. Transit

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<sup>23</sup> Dolce, John E. *Analytical Fleet Maintenance Management, Third Edition*. SAE International, 2009, p. 349.

<sup>24</sup> *Ibid*, p. 29.

also lacks documented guidance for on-site inspection. However, since the inception of this audit, Transit reports that they have initiated updates to several portions of the documents.

**On-Site Inspection  
Directly Influences the  
Quality and Ongoing  
Cost of Transit's Buses**

The on-site inspection process is costly and directly influences the quality and ongoing maintenance costs of Transit's buses. The approach to on-site inspection should be efficient, with clear methods to achieve quality, and it should ensure inspector accountability. The on-site inspection activities should produce a high-quality bus in line with Transit's contract with the bus manufacturer and strategic procurement goals.

Direction from Transit to inspectors is mostly informal and undocumented; Transit does not have specific policies or procedures relating to on-site inspection. Without clear, documented policies and procedures related to inspection, Transit may miss opportunities to identify problems that could be resolved with much less cost both to the bus builder and to Transit.

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**RECOMMENDATION 6**

Transit should update its inspection policy and procedure, defining specific methods to achieve quality and ensuring accountability and ensure that inspection processes and forms reflect a rigorous approach to all phases of the inspection process.

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# 5 TIMELINESS OF NEW BUS DELIVERIES

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## **Chapter Summary**

This final chapter includes the calculation of a performance measure that indicates timeliness of new bus deliveries. Because Transit does not currently have necessary data available for review, we calculated an interim measure showing the duration of portions of the procurement process. We recommend that Transit collect and analyze data to enable them to calculate a measure to improve timeliness of new bus deliveries.

As noted in Chapter 2: Bus Procurement Planning and Performance, both performance measures and targets will need to be continually reassessed and updated to ensure ongoing relevance.

## **Timeliness of New Bus Deliveries**

### **The Bus Replacement Process Is Predicated on Timely Bus Delivery**

Timeliness measures indicate whether a newly purchased fleet is ready for operation when it is needed. The *Fleet Manager's Guide to Vehicle Specification and Procurement* states:

“It is important to monitor progress because the replacement process is predicated on a timely delivery. This allows for the removal of the old vehicle before excessive maintenance costs are incurred, which would upset economic efficiencies. Not only is the user expecting the vehicle on a delivery date agreed upon, but the maintenance department could be deferring unnecessary repairs that would impact wasteful spending.”<sup>25</sup>

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<sup>25</sup> Dolce, John E. *Fleet Manager's Guide to Vehicle Specification and Procurement*, 2<sup>nd</sup> Edition. SAE International, 2003, p. 20.

Failure to replace a bus when needed increases maintenance costs and the need for replacing buses in the field that stop functioning while providing service to passengers. In addition, when transit agencies expand service, any delay in delivery of new buses to meet those service expansions can disrupt planning.

The best timeliness performance measures are those that track achievement of high-level goals for timeliness, such as delivering new vehicles in time to retire buses at their economically optimum replacement point, or to begin new service on schedule.

Timeliness can be measured generally in two ways: total *duration* and *deviation* from targets. These methods are explained below.

**Duration measures** calculate the length of time between two dates. Examples of duration measures include:

- Length of time between initiation of procurement activity and the issuance of an RFP,
- Length of time between the issuance of the RFP and the signing of a contract,
- Length of time between the signing of a contract and the delivery of buses, and
- Length of time between the delivery of buses and the entrance of buses into service.

**Deviation measures** calculate the difference between a preset target date and the actual date. For example:

- Difference between planned RFP issuance date and actual issuance date,
- Difference between planned delivery date and actual delivery date,
- Difference between planned in-service date and actual in-service date, and



- Difference between optimum replacement date and actual replacement date.

Transit currently has the data and ability to calculate various duration measures. Targets for duration measures can be set based on a variety of methods, including continuous improvement on previous procurement processes or comparison with efficient peers' procurements.<sup>26</sup>

Transit does not currently have a model to calculate the optimal economic replacement point of their fleets, a key input to deviation measures.<sup>27</sup> In response to changing policies and revenue scenarios, Transit prepares annual (or more frequent) updates to its fleet plan, which identifies scheduled dates to replace or add buses. The frequency with which the planned dates, quantities, and types of buses change from year to year makes it impossible to use the fleet plan to calculate deviation measures.

When Transit is able to calculate deviation measures, the target is 100 percent achievement of the preset target dates, or zero percent deviation. 100 percent compliance with schedule may not be a reasonable target in some cases,<sup>28</sup> but deviations should be investigated and understood.

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<sup>26</sup> Most of the respondents in our industry survey reported not tracking timeliness of new bus deliveries. Two respondents reported only that they track contractual delivery schedules and try to work with bus builders if they are not meeting schedules.

<sup>27</sup> In our 2009 performance audit of Transit, we found that Transit does not yet utilize economic replacement analysis in replacing their bus fleets. We recommended that Transit create economic replacement analysis model to inform its vehicle replacement decisions. In response to this recommendation, Transit has partnered with Portland State University's Oregon Transportation Research and Education Consortium (OTREC). Together, Transit and OTREC will "develop a new generation of fleet replacement models that can incorporate purchase, operational, and emissions costs, brought about by new engine/fuel types and heterogeneous commercial vehicle fleets." This work is planned for completion in Fall 2011.

<sup>28</sup> Our performance audit of County Vehicle Replacement (2006) discussed some valid reasons for deviating from replacement schedules. For example, if a major system, such as an engine or a transmission, has been replaced recently, a fleet management agency may reasonably decide to keep a vehicle in service. On the other hand, some vehicles may be "lemons" that should be disposed of sooner (pp. 11-12).

*Duration Measures*

The Exhibit V shows two duration measures for the current Transit fleet: RFP to Contract and RFP to In Service date.

<b>EXHIBIT V</b>				
<b>Calculation of the Bus Procurement Timeliness Performance Measure (Duration)</b>				
<b>Contract</b>	<b>Manufacturer and Model Year</b>	<b>Type</b>	<b>RFP to Contract (months)</b>	<b>Contract to In Service (months)</b>
MB 94-1	1996 Gillig	35 ft diesel	12.4	26.5
MB 94-1	1996 Gillig	40 ft diesel	12.4	22.7
MB 96-2	1999 New Flyer	60 ft diesel	10.1	25.6
MB 97-1	1999 Gillig	30 ft diesel	10.3	17.8
EB 99-1	Metro	40 ft trolley	13.6	26.7
MB 01-1	2002 Champion	25 ft diesel	7.8	10.7
MB 01-2	2003 New Flyer	40 ft diesel	10.6	16.2
MB 03-1	2004 New Flyer	60 ft diesel	8.5	8.2
MB 03-1	2004 New Flyer	60 ft hybrid	8.5	10.1
MB 06-1	2008 StarTrans	27 ft diesel	16.6	29.6*
MB 06-2	2008 New Flyer	60 ft hybrid	8.5	18.0
<b>Average</b>			<b>10.8</b>	<b>18.6</b>
<b>Note:</b> * This number is a running total. The StarTrans fleet is not yet in service.				

**SOURCE:** King County Auditor's Office and King County Metro Transit

On average, it took Transit about 11 months from the point of issuing an RFP to signing a contract with a bus builder. It took approximately 19 months after contract signing to put the bus into service.

In the absence of a deviation target set by an economic replacement model, Transit can use these averages as initial targets for future procurements.

## **APPENDICES**

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## SUMMARY OF RECOMMENDATIONS & IMPLEMENTATION SCHEDULE

### Recommendation 1

Transit should develop a prioritized set of strategic procurement goals guided by council policy that are fully documented, communicated, and used to guide procurement processes and decisions.

**Implementation Date:** First Quarter 2011

**Estimate of Impact:** Implementing this recommendation will help Transit achieve three goals with each procurement. First, the buses are more likely to minimize lifecycle cost while incorporating policy goals. Second, buses purchased will operate Transit's planned service. Finally, the buses purchased will have the highest quality at the lowest lifecycle cost and best value. In addition, implementation will permit stakeholders to provide sufficient input into procurement processes, increasing the likelihood that buses Transit purchases meet customer, operator, maintenance, service, and regional needs. These changes will positively impact the cost, quality, and timeliness of Transit's buses.

### Recommendation 2

Transit should update procurement policies and procedures, ensuring that the structure of the procurement process efficiently facilitates strategic procurement goals and clarifies roles and responsibilities.

**Implementation Date:** Second Quarter 2011

**Estimate of Impact:** Implementing this recommendation will allow management to guide bus procurement processes, increasing the likelihood that strategic procurement goals drive procurement decisions and that agency goals are met. In addition, implementation will permit stakeholders to provide sufficient input into procurement processes, increasing the likelihood that buses Transit purchases meet customer, operator, maintenance, service, and regional needs. These changes are intended to positively impact the cost, quality, and timeliness of Transit's buses.

## **Summary of Recommendations & Implementation Schedule (Continued)**

### **Recommendation 3**

Transit should conduct and document annual retrospective processes to calculate and evaluate procurement performance measures and should develop action plans to improve outcomes; these processes should also consider the effectiveness of the measures and targets, and revisions that may make them more effective.

**Implementation Date:** Fourth Quarter 2011

**Estimate of Impact:** By implementing this recommendation, Transit will be able to evaluate and improve their organizational performance, achieve larger organizational goals, identify key areas on which staff can focus improvement efforts, develop a culture of self-improvement and accountability, communicate results to stakeholders, instill public confidence, and facilitate oversight. Implementing this recommendation will require Transit staff time and resources.

### **Recommendation 4**

Transit should fully analyze the costs and benefits of an array of fleet alternatives that could deliver the potential range of future service and meet strategic goals before making final procurement decisions.

**Implementation Date:** First Quarter 2011

**Estimate of Impact:** Implementation of this recommendation will help Transit to determine what the most cost-effective fleet should be in terms of number, type, and capacity to most effectively and efficiently deliver the potential range of future service and meet strategic goals. Implementing this recommendation will take staff time and depending on the method of implementation, may require purchase and/or licensing of specific software.

### **Recommendation 5**

For each bus procurement, Transit should estimate and compare the full cost and anticipated benefits of utilizing Transit staff to conduct on-site bus inspections versus contracting out this service and document the decision.

**Implementation Date:** Fourth Quarter 2011, in anticipation of trolley replacements

**Estimate of Impact:** Implementing this recommendation will help Transit in selecting the most cost-effective approach to on-site inspection given the specific vehicle, manufacturer, and economic environment for each individual procurement.

## **Summary of Recommendations & Implementation Schedule (Continued)**

### **Recommendation 6**

Transit should update its inspection policy and procedure, defining specific methods to achieve quality and ensuring accountability and ensure that inspection processes and forms reflect a rigorous approach to all phases of the inspection process.

**Implementation Date:** Fourth Quarter 2010

**Estimate of Impact:** Implementing this recommendation would help ensure that inspection work is conducted consistently and effectively while providing specific methods to monitor and improve inspection performance. Better bus inspection will result in higher-quality buses that have lower lifecycle and administrative costs.

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## EXECUTIVE RESPONSE



**King County**

**Dow Constantine**  
King County Executive  
401 Fifth Avenue, Suite 800  
Seattle, WA 98104-1818  
**206-263-9600** Fax 206-296-0194  
TTY Relay: 711  
www.kingcounty.gov

**KING COUNTY AUDITOR**

SEP 03 2010

**RECEIVED**

September 3, 2010

Ms. Cheryle Broom  
King County Auditor  
Room 1033  
C O U R T H O U S E

Dear Ms. Broom:

Thank you for your August 18, 2010 letter and the opportunity to review and comment on the proposed final report of the King County Metro Transit Bus Procurement performance audit. I also would like to thank the staff in the King County Auditor's Office for their thoughtful review of the county's bus procurement process. As you know, I am interested in opportunities for continuous business process improvement and the audit report identifies a number of areas for our consideration. Attached to this memo is our response matrix.

While there are opportunities for improving the planning and administration of bus purchases, I was encouraged to see the audit found a number of areas where Metro Transit's bus procurement processes are successful and a model for the transit industry. The results of this audit are consistent with results of previous Federal Transit Administration triennial audits and regular procurement system reviews of Metro Transit. Metro Transit frequently shares contract specifications throughout the industry and more than a dozen transit agencies over the years have found Metro Transit's practices to be efficient and effective and have chosen to use Metro Transit's procurements to acquire new buses. Specifically the audit cites the following areas as being successful:

- Metro Transit pays less than many other agencies for the buses that we purchase. With respect to the price paid for buses, the report indicates that "Transit has been generally successful in purchasing similar buses at lower cost than other transit entities we surveyed." This finding is particularly rewarding given other findings such as "Many of Transit's purchases involve complex and costly vehicles compared to the continuum of vehicle options."



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## EXECUTIVE RESPONSE (Continued)

Cheryle Broom  
September 3, 2010  
Page 2

- Metro Transit is successful in estimating the price of buses as evidenced by the fact that independent cost estimates are within 10 percent of the purchase price. This allows higher certainty in planning for fleet replacements and provides some assurance as to prices charged by bus builders.
- While indicating concerns with Metro Transit's approach to on-site inspection, the auditors also noted that "bus manufacturers with whom we communicated noted that Transit's on-site inspection teams are highly capable and effective and in some cases assisted the bus manufacturer in making improvements that were incorporated into future bus builds."
- Despite raising questions about the appropriateness of the current bus fleet, specifically the use of articulated coaches that tend to be more expensive to maintain, your analysis "...suggests that Transit is effectively using larger buses to move passengers."

Your recommendations regarding analysis of fleet mix will get careful consideration. Purchase of a bus is a 12-18 year decision and will have an impact on customers, transit operators, mechanics and the operating costs of the organization during its lifetime. The decision on what type of vehicles to procure is one that needs to consider many variables including operating and maintenance costs. Metro Transit pioneered the use of articulated coaches as a cost-effective way to move more customers and your audit confirmed the fact that Metro Transit is effectively utilizing the articulated fleet.

A primary area of recommendation identified in the audit is the development of strategic procurement goals that allow policy makers as well as Metro Transit to be confident that "the right buses are being purchased at the right time for the right price." The audit finds that bus procurements are not currently guided by Metro Transit or county goals. While Metro Transit's current strategic plan includes some goals related to bus fleets, we will be examining these goals along the lines of your suggestions as we work with the County Council on an update of the Transit Strategic Plan later this year and next year.

Service guidelines are also under development to be adopted as part of the updated strategic plan in 2011. These guidelines should provide clarity around policies associated with bus characteristics such as number of seats, standing capacity, etc. Both the Transit Strategic Plan and the Service Guidelines will be used to support the fleet planning activities discussed above.

Prior to the initiation of this audit, Metro Transit was evaluating elements of its bus procurement process in order to identify improvements. Much of this work has incorporated the findings of your audit and will enable Metro Transit to implement some elements more quickly than others.


## EXECUTIVE RESPONSE (Continued)

Cheryle Broom  
September 3, 2010  
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While I support the audit recommendations, I will be directing the agency to pursue these in a thoughtful manner that considers the cost and benefits of the approaches recommended. As noted in the audit, these changes would provide Metro Transit with a "cutting edge" procurement process. In these times of reduced resources, we need to make sure that we implement cost effective processes. Being the "cutting edge" may be more costly than we can afford at this time.

If you have any questions regarding our audit responses, please contact Kevin Desmond, Transit General Manager, at 206-684-1619.

Sincerely,

  
Dow Constantine  
King County Executive

cc: Harold S. Taniguchi, Director, Department of Transportation (DOT)  
Kevin Desmond, General Manager, Metro Transit Division, DOT

## EXECUTIVE RESPONSE (Continued)

### King County Metro Transit Response to King County Auditor Report on Metro Transit Bus Procurement

Recommendation	Agency Position	Schedule for Implementation	Comments
#1. Transit should develop a prioritized set of strategic procurement goals guided by council policy that are fully documented, communicated and used to guide procurement processes and decisions.	Transit concurs with the recommendation.	First Quarter 2011	Transit's existing 10 year Strategic Plan includes policy direction for fleet procurement. This will be reviewed and modifications proposed to council as part of the plan update scheduled in early 2011.
#2. Transit should update procurement policies and procedures, ensuring that the structure of the procurement process efficiently facilitates strategic procurement goals and clarifies roles and responsibilities.	Transit concurs with the recommendation	Second Quarter 2011	Transit-specific procurement policies and procedures, including roles and responsibilities, have been recently updated. Upon council adoption of the strategic plan update in 2011, these policies and procedures will be reviewed to ensure appropriateness with the strategic goals.
#3. Transit should conduct and document annual retrospective processes to calculate and evaluate procurement performance measures and should develop action plans to improve outcomes; these processes should also consider the effectiveness of the measures and targets and revisions that may make them more effective.	Transit concurs with clarification.	Fourth Quarter 2011	Transit acknowledges the value of tracking performance measures and using the information to improve processes. Clarification is needed between performance measures associated with the experience of a given bus purchase and how that experience can inform future procurements and the procurement process itself. Results from measuring performance will be incorporated into the decision-making process around bus procurement.
#4. Transit should fully analyze the costs and benefits of an array of fleet alternatives that could deliver the potential range of future service before making final procurement decisions.	Transit concurs with clarification. The costs and benefits of a bus are only part of the equation. Policy decisions need to be incorporated as well.	First Quarter 2011	As noted in the audit report, Transit is in the process of updating both its Strategic Plan as well as Service Guidelines. Policy choices adopted as part of these processes will inform the fleet planning process.

## EXECUTIVE RESPONSE (Continued)

### King County Metro Transit Response to King County Auditor Report on Metro Transit Bus Procurement

Recommendation	Agency Position	Schedule for Implementation	Comments
#5. For each bus procurement Transit should estimate and compare the full cost and anticipated benefits of utilizing Transit staff to conduct on-site bus inspections versus contracting out this service and document the decision.	Transit concurs with this recommendation.	Fourth Quarter 2011 – in anticipation of Trolley Replacements	Transit will develop a cost/benefit approach to evaluating methods for on-site inspection. Labor implications may impact the timing of fully implicating this recommendation.
#6. Transit should update all inspection policy and procedures, defining specific methods to achieve quality and ensuring accountability and to ensure that inspection processes and forms reflect a rigorous approach to all phases of the inspection process.	Transit concurs with this recommendation.	Fourth quarter 2010	Policies and procedures are in the process of being updated.

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## **AUDITOR'S COMMENTS TO EXECUTIVE RESPONSE**

Transit will initiate two procurements in 2011; the process to procure 30-foot buses is scheduled to begin in January 2011, and the process to replace the trolleys is planned later in 2011. These two procurement processes will be costly and important to Transit operations. The risk of delaying implementation of audit recommendations is that opportunities to reduce the cost, enhance the quality, and improve the timeliness of upcoming bus purchases could be lost. Because Transit invests such significant resources in procurements, even small efficiencies gained from implementation of audit recommendations could result in considerable savings.

Our first recommendation is that Transit develop strategic procurement goals. These strategic procurement goals should be completed for each individual procurement process initiated by Transit. If Transit would like to set general strategic procurement goals as indicated in the executive response, this could be in addition to the recommended strategic procurement goals for each individual bus procurement.

Transit requested clarification regarding our recommendation that Transit conduct and document annual retrospective processes that calculate and evaluate procurement performance measures. "Clarification is needed between performance measures associated with the experience of a given bus purchase and how that experience can inform future procurements and the procurement process itself." The auditors' intention was that all indicated benefits could be realized through calculation of the performance measures and development of action plans: 1) determine the effectiveness of an individual bus purchase, 2) inform future bus procurements, and 3) inform the bus procurement process itself.

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